DOCUMENT RESUME

ED 342 951 CE 060 535

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TITLE Women in "Male" Careers: The Case of Higher Technicians in France.
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REPORT NO ISSN-1156-2366
PUB DATE 92
NOTE 5p.
PUB TYPE Collected Works - Serials (022) -- Information Analyses (070)
JOURNAL CIT Training & Employment: French Dimensions Newsletter; n6 p1-4 Win 1992

EDRS PRICE MF01/PC01 Plus Postage.
DESCRIPTORS *Career Choice; Course Selection (Students); Employment Patterns; Engineers; Family Influence; *Females; Foreign Countries; *Nontraditional Occupations; Paraprofessional Personnel; Parent Influence; *Science Careers; Scientific Personnel; Sex Differences; Sex Fairness; *Student Educational Objectives; Technical Education; *Technical Occupations; Womens Education
IDENTIFIERS *France

ABSTRACT

French statistics show that in the area of training and employment, differences in behavior patterns between men and women have diminished considerably. Nonetheless, sexual segregation remains strong, especially in scientific and technical fields. Distribution among training streams remains uneven. In tertiary and upper-level education and training, women are underrepresented in the scientific and technical programs. In the universities, the proportion of women in the sciences has remained stable; all other specializations show increases. A form of job segregation concentrates women in a limited number of occupations, notably personal services, health care, and office work. Technicians are 10.4 percent women, engineers and technical managers, 9.8 percent. A French study explored social conditions and processes that lead young women to pursue male-dominated training and employment. Data were obtained through interviews with 47 young women enrolled in technical training, and some of their parents, principals, and teachers. A combined analysis of social rationales brought out features common to the cohort studied: families expected a great deal from the young women in terms of socio-occupational advancement and counted on their academic success to bring this about; academic performance was average, with emphasis on "scientific" subjects; and a gender dynamic led the girls to assume a boy's role. Three post-degree itineraries can be extrapolated from the respective weights of these social rationales within the family configurations and the way they are combined. (16 references) (YLB)

ED342951

TRAINING & EMPLOYMENT

FRENCH DIMENSIONS

No 6
Winter 1992

Women in "Male" Careers: The Case of Higher Technicians in France

TECHNICAL skills, especially those that are deemed socially valuable, have always been crucial to the sexual division of labour [Tabet 1979, Flament 1985], and industrial societies are no exception [Cockburn 1985]. In specific terms, the closer a technical job is related to the production process and the higher its social value (in terms of its role in social reproduction, e.g., the new technologies), the less likely it is to be performed by a woman. Whatever the nature of the job, moreover, a woman is less likely to have access to it when supervisory and administrative functions are involved [Volkoff 1987].

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WOMEN IN "MALE" CAREERS: THE CASE OF HIGHER TECHNICIANS IN FRANCE

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THE SEXUAL DIVISION OF TRAINING AND EMPLOYMENT IN SCIENTIFIC AND TECHNICAL CAREERS

FRENCH statistics show that in the area of training and employment, differences in behaviour patterns between men and women have diminished considerably over the past twenty years, and in certain respects trends even appear to have been reversed. Nonetheless, sexual segregation remains strong, especially in scientific et technical fields.

Young Women in Training Streams

In France today, young women are more "educated" than their male counterparts. Since 1968, they have constituted the majority of new baccalauréat-holders, and since 1982, they outnumber young men in the student population at large. This rise in the female education level has begun to make itself felt in the general population as well: according to the 1989 labour-force survey, 18 percent of women in the 25-39 age group have some higher education, compared with 16.2 percent of men in the same group.

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At the same time, however, distribution among training streams remains uneven. Thus, in 1989, 81 percent of students passing the baccalauréat in the "A" sections (literary) were female, as compared to 5.9 percent in the "E" sections (scientific and technical).

In general, when young women enter technical streams, they opt for specialisations in the service sector. This is the case for short technical training (CAP and BEP degrees), where, in the class of 1988, 77-78 percent of the young women were concentrated in tertiary specialisations and only 12 to 15 percent in manufacturing. The proportions were comparable for the technological baccalauréats: 70 percent of young women in tertiary-related fields and 10.5 percent in manufacturing [INSEE 1991].

This tertiary/manufacturing gap is also very large for post-baccalauréat study (Bac +2):

Percentage of Female Students in Technical and Scientific Programmes 1988-1989

%

Percentage of Female Students	IUT (1)	STS (2)	CPGE (3)
Manufacturing Sections	19.0	15.5	20.8 (Scientific Courses)
Tertiary Sections	60.1	68.0	68.7 (Literary Courses)

Source: Ministry of Education.
(1) IUT= technological institutes (university-level).
(2) STS= higher technician sections.
(3) CPGE= preparatory classes for competitive universities (Grandes Écoles).

This male-female distribution tends to even out over time, but the process is a slow one: between 1975 and 1989, the proportion of young women increased from 17.9 to 19 percent in the university-level manufacturing sections (IUTs), and from 14.9 to 15.5 percent in those of the vocational certificate programmes (STSs).

If the proportion of young women in technical training programmes is broken down by specialization, the sexual segregation appears to be even more marked:

Proportion of Young Women by Manufacturing Specialisations 1988-1989

%

	BAC (1)	IUT (2)	STS (2)
Chemistry and Biology	41-72	50-60	52-75
Mechanical Engineering Electronics Electrical Engineering Civil Engineering	3-11	1.4-7 (Civil, Electrical, Mechanical Engineering)	1.5-2.8 (Electrical, Mechanical Engineering, Electronics)

Source: Ministry of Education.
(1) Percentage of young women among baccalauréat candidates.
(2) Percentage of young women in total student population.

Young women are well represented in upper-level training courses, but here too, there are considerable differences according to specialisation, with under-representation in the scientific and technical programmes. A 1985 survey of the 16-34 age group, for example, showed that an equal number of men and women --15 percent-- had continued their studies after the baccalauréat, but three times fewer women (16% vs. 45%) had opted for scientific programmes [Marry 1989].

In the universities, the proportion of women is highest in letters, pharmacy and law (55-70% depending on the field) and lowest in the sciences (34.5%). The proportion in the sciences has remained remarkably stable, moreover (30-33% for the last thirty years), while all the other specialisations showed an increase between 1971 and 1988 (from 39 to 55.7% in law, from 32 to 46.5% in medicine, from 26.5 to 48% in economics). It should also be noted that the proportion of science majors among female students remains stable (around 16%), while among male students it has increased steadily (roughly from 30 to 45% between 1971 and 1984).

In the engineering schools, the percentage of women has shown a marked increase (from 6% in 1972 to 19.3% in 1989), even though they remain in the minority, particularly at the most prestigious schools [Marry 1989].

▮ *Male-Female Distribution in Employment*

Corresponding to this sexual division of training is a form of job segregation that concentrates women in a limited number of occupations, notably those involving personal services, health care, and office work (stenographic and secretarial)[Huet 1983, CNIDF-INSEE 1986, INSEE, 1991]: in 1989, 48.7 percent of economically active women were clerical or service workers.

When they hold technical jobs in manufacturing, they are above all unskilled workers (6.3% of economically active women in 1989), a category that is 38% feminised. Women are particularly under-represented among skilled workers (2%), foremen and supervisors (0.4%), technicians (0.9%), and engineers and technical managers (0.5%). The technician category includes 10.4% women, that of engineers and technical managers, 9.8%. These jobs are becoming feminised, however, at least for engineers and technical managers: in 1982, the proportion of women was only 6.4 percent [INSEE 1991].

Among European countries, France has shown one of the greatest advances in the feminisation of training programmes for engineeers [Marry 1989]. In the former West Germany, for example, as of 1989 women represented 11.9 percent of engineering students at the university level (compared to 6.4% in 1975) and 12.4 percent of students at the higher technical schools, or Fachhoschulen (compared to 8% in 1975). They remain a much smaller minority on the job, meanwhile, accounting for less than 2 percent of active engineers [Rudolph 1991].

In Spain, as of 1986 women represented 8.6 percent of engineering students at the higher technical schools and university departments of architecture and engineering sciences (compared to 4.2% in 1981); at present they constitute 18% of the student population in the higher technical schools. Once they obtain their degrees, however, they encounter considerable difficulty in finding a job: their rates of economic activity are relatively low, and they are disproportionately affected by the unemployment that faces more than 25 percent of university graduates (8.2% of the men) and 17.5 percent of higher technical school graduates (5.5% of the men) [Alemany 1990]. In Great Britain, notwithstanding special programmes to encourage female entry into scientific and technical fields (GIST, Girls into Science and Technology, and WISE, Women into Science and Technology), in 1986-1987, only 11.8 percent of university students in engineering and technical science programmes were women (12% among the undergraduates and 9.2 percent among graduate students, compared, however, to 1.5% and 1.6% respectively in 1968-1969). In the polytechnic institutes, they accounted for 23.5 percent of technology students and 3.7 percent of engineering students. The employment situation, meanwhile, is comparable to that in France, with women constituting 10 percent of scientific and technical managers in 1987 [Hantrais 1990].

TRAINING CHOICES AND LABOUR-MARKET ENTRY AMONG FEMALE HIGHER TECHNICIANS

WHAT social conditions and processes lead young women to pursue training and employment channels that are generally male dominated? Some answers to these questions are suggested by a study conducted among young women enrolled in advanced training programmes in fields related to the new industrial technologies.[1] The fact that the careers selected are production-related (technician), entail both skills and responsibilities (higher technician), and fall within the leading manufacturing sectors (new technologies) means that, in principle and practice alike, they are male strongholds: in 1987, young women constituted between 3 and 6 percent of these categories nationally.

The Survey

The material presented here comes from a survey conducted at the Aix-Marseilles Academy in 1986-1987. It included all the young women (n = 47) enrolled in training streams leading to a BTS or DUT in the following fields: automated engineering, electronics and manufacturing-related computer science for the BTS, and mechanical engineering and manufacturing automation, electrical engineering and manufacturing-related computer science for the DUT.

The data were primarily obtained through semi-directive interviews conducted with the young women, some of their parents, school principals, and teachers of courses relevant to the study.

The main results of this research can only be very briefly summarised here. For a more extensive presentation, see Daune-Richard and Marry [1990].

The Choice of "Male" Training Programmes: A Combination of Social Rationales

The socio-educational trajectories considered here are the product of multiple and sometimes contradictory social rationales: the social status of a given occupation, success versus failure in the educational system, and domination versus subordination in male-female relations.

A combined analysis of the various rationales brings out certain features common to the cohort studied.

• The young women's families expected a great deal from them in terms of socio-occupational advancement and counted on their academic success to bring this about. There were various reasons behind the concern for socio-occupational mobility. A working-class family, for example, might have owed its sharp upward mobility to the efforts of the father, who had invested considerable time and energy in continuing training courses in order to become a technician or even an engineer. Conversely, the parents might have been frustrated in their own ambitions to "go on with their studies" because of financial limitations or an early academic failure that would automatically have meant going to work instead. There were also several cases of downwardly mobile families hoping to "catch up" through the success of their children.

[1] Higher technician degrees require two years of study following the baccalauréat. These take place in the high schools for the higher technician certificate (Brevet de Technician Superieur, or BTS) and in the university institutes of technology (Instituts Universitaires de Technologie, or IUTs) for the university diploma in technology (Diplomes universitaires de Technologie, or DUT). A more extensive explanation of the French educational system appears in the third issue of this newsletter (Spring 1991).

• Academic performance was average neither outstanding, nor poor, with an emphasis on "scientific" subjects. The DUT often served as a springboard for further study: this might come about by choice (underestimated capabilities) or by obligation (poor academic performance), but in any case, the possibilities it offered were considered interesting. For the BTS candidates, the choice of a technical option fell within an academic strategy aimed at going "as far as possible" rather than a rationale of professionalisation. This degree was seen as a final step that allowed the young women to reach a respectable level of higher education without going through university programmes that were considered "too general" and "leading nowhere".

In sum, it was the combination of anticipated social mobility (in particular milieus where the predominant manufacturing occupations constitute the recognised path of mobility) with a certain rationale of academic success and failure that oriented the young women towards highly skilled technical professions. At the same time, however, the choice of such typically "male" fields only takes on its full meaning in the context of the specific family situations in which these young women grew up.

• There was, first of all, a gender dynamic that led the girls to assume, to some extent at least, a boy's role. Normally, the responsibility for fulfilling parental aspirations with regard to social status falls on the sons rather than the daughters [Chaudron 1984]. In our survey group, however, the sons were in some way missing: either physically (the girls were only children, their siblings were all female, or their brothers had died), or because of the brothers' flagrant academic failures. In the first instance, the girls filled the role of the "missing boy" (analysed by Lasvergnas [1987] in relation to women scientists in Quebec and observed by Janhsen and Rudolph [1987] among women engineers in West Germany); in the second, the girls were "surrogate boys".

This absence of boys was particularly felt in situations where the father had been thwarted in his desire to become an engineer (because of family circumstances that did not permit further studies, failure in the early stages, or even, via continuing education, access to an engineer "function" without the title). In this case, the goal was transferred to the child (or children), who might well be a girl if there were no sons capable of achieving it.

In certain instances it was the mother's unfulfilled ambitions that were transferred onto the daughter, but these were generally less defined than those of the father. Here, it was rather a case of permitting--if not pushing--the daughter to enter a profession that was skilled, socially valued, traditionally male, and sometimes technical. Reacting to the inequality that they had experienced in their relationships with men, the mothers transferred to their daughter(s) their own aspirations for greater independence, for autonomy relative to the uncertainties of marriage, and possibly greater respect from the husband. More generally, on the basis of their own family experience and especially their childhoods, they were calling into question the arbitrariness and inequality of male-female relations.

Thus the training plans of the young girls interviewed were shaped through a process combining the expectation of mobility through academic qualifications and career with the gender dynamic "inherited" from their own families (although they were not always totally conscious of it). In any case, the "technical" criterion was secondary to the two dominant "rationales" in this process: it was seen as a means more than an end in itself [Flament 1989].

Continuity of Training Plans and Entry Patterns

Analysing these atypical career paths in terms of combined social rationales not only brings out the complex process through which young women enter "male" training programmes, but also helps to explain, if not predict the paths of labour-market entry. In practice, three post-BTS/DUT itineraries can be extrapolated from the respective weights of each of these social rationales within the family configurations and the way they are combined.

• In one group, where the families had little educational background, social mobility was the dominant issue. The daughters were close to their fathers and frequently worked with them around the house. Thus they accepted the plans that the father made for them in place of a brother. When the time came to begin working, however, the coherence of the plans broke down: the "male" programme was entirely the father's doing. Further complications arose from the facts that the mothers had assumed very traditional gender roles and the fields the girls had chosen were among the least open to women (e.g., mechanical engineering). As a result, they had great difficulty obtaining their degrees and tended to reorient themselves towards jobs that were deskilled and/or remote from their initial training (salesperson, police officer).

• In a second group, the parents, and especially the mothers, had higher levels of training. The rationale of socio-occupational mobility was again dominant, but it was mainly promoted by the fathers, who represented particularly authoritarian figures. The mothers, meanwhile, well aware of gender issues, encouraged the daughters to have a career in order to cope with the unexpected (divorce, widowhood) or to acquire a certain independence in relation to their husbands.

In this group, it was the fact of having a good job that lent coherence to the plans, with the "male" aspect often more or less imposed by the father. The transition between training and employment again led to a reorientation, but in this case, towards skilled occupations (school teacher, flight attendant). Those who continued with their training opted for fields that are relatively open to women (e.g., computers). Whatever the case, the diploma represented a general level of training more than a level of qualification for a specific occupation.

• In a third group, family patterns were very specific. Both parents were concerned with social mobility, but not in a pressing, or in any case, limiting way. This flexibility also held for gender issues, insofar as parental sex roles were very fluid. The fathers, actively participating in domestic tasks, were sometimes described as "house-husbands", while the mothers worked outside the home and had the same skills levels as their husbands. Each parent, moreoever, had played an atypical gender role as a child: the mothers were tomboys; the fathers grew up in female environments, especially following the death of their own fathers. In fact, both parents seemed to agree that their children, whether boys or girls, should have normal ambitions and enter socially respected professions without regard for gender roles. In this group, the young women developped male career plans accompanied by strategies for avoiding the mother-wife role (late marriage, postponement of first child). They easily assumed higher technician positions in industry.

•••

This study of the conditions leading women to enter--and remain in--traditionally "male" areas of training and employment brings out two main dynamics within the process: on the one hand, there is the massive "resistance" of forces tending to reproduce distinct "male" and "female" tracks, and on the other, the complexity of the processes of change. As our investigation shows, it is in fact the mixing of criteria belonging to distinct social rationales that permits the actors, individuals and institutions alike, to operate within--but also to modify--the contours of social reproduction, in this instance the sexual division of labour.

Anne-Marie Daune-Richard

(Translation by Miriam Rosen)

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Direction de la publication : Yves Lichtenberger - Secrétariat de rédaction : Béatrice Belbenoit

ISSN 1156-2366

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